

Fabric and finished garments that are kind to the wearer's skin are of growing importance in our health-conscious world, and the implications for sports and activewear are obvious.

Only natural for cellulose and linen to score skin-friendly success

In-demand textile trends expert Ornella Bignami, who runs her own studio, Elementi Moda, in Milan, believes that wearing linen garments can make the skin healthier. Linen is one of the most ancient fabrics known to humankind; there are fragments of linen from Egyptian mummies that are now 6,000 years old. Nevertheless, clever companies are still finding ways to improve it; for example, producers have recently found ways to make it more crease-proof.

Its main quality, however, according to Ms. Bignami, is that it is "the most natural fibre of all". This begins with the flax plants from which linen comes. They often grow right on the coastline in

places such as northern France, Belgium and the Netherlands with the incoming tides constantly washing the plants as they grow. As a result of this natural quality, linen sheets are naturally non-allergenic (although the dyeing process can, unfortunately, detract from that) and enable more restful sleep.

One recent development Bignami has seen in the sports arena is a specialist golf collection at Barbera's high-end boutique off the Via Montenapoleone in Milan, which makes use of linen. "Linen is fresh, easy to wear," she says, "and it helps keep your body temperature constant. I would go so far as to say that if you wear linen for sports activity, the condition of your skin can improve."

Natural over synthetic

More about golf later on, but first it's worth considering a new advantage natural fabrics may have in the present economic climate. Any attempt to make synthetic textiles skin-friendly is becoming more difficult and more expensive, certainly in Europe. Professor Michael Braungart, who combines a teaching position at the University of Lüneburg in northern Germany with specialist consultancy work on the design of products that are good for us and good for the planet, fears that the new REACH legislation may make any innovation involving chemical treatments much more difficult, and any resulting products more expensive for the buying public.

REACH, which came into effect on June 1, means chemical manufacturers must register all the products they make or import for the European market in quantities greater than one tonne per year; registration is a costly business. "REACH is the most stupid piece of legislation that Europe has ever come up with," the professor says bluntly. Braungart worked with Lenzing on testing the benefits of a range of clothing made from its Tencel fabric especially for people with sensitive skin (see WSA March/April 2007). Tencel, too, is considered a natural fibre, extracted from beech trees. Another manufacturer he likes is Trigema, a firm based in Burladingen, near Reutlingen in Germany. He proudly shows off a Trigema T-shirt that he claims has been made entirely with contact with human skin in mind. Every single ingredient and component—the fabric, the dyes, the labels, the thread, everything—is designed to be kind to the skin and kind to the environment. Companies may be able to carry out their design and manufacturing activities more economically outside Europe, Professor Braungart argues, but some are making what he insists on calling "amazingly toxic and dangerous products" as a result.

A natural progression

Innovation can also mean applying established technology to new ideas, as Lenzing proved with its sensitive-skin project, and the Austrian textile manufacturer is now preparing to use the knowledge it has built up regarding Tencel's positive effect on the skin to push into the sports and activewear market with it. Head of business development for apparel, Andreas Gürtler, explains that the company has already begun looking at different fabric combinations for Tencel with various levels of athletic activity in mind.

For high performance sports such as distance running, mountain biking or climbing, the best combination appears to be to put polyester on the inside of a garment, for its wicking properties, and Tencel on the outside to absorb moisture and release it little by little into the

Coolmax and Tencel: a natural combination

Textile manufacturers have been extracting fibres on a commercial basis from cellulose—one of the natural polymers that appear in plants—since the 1880s. However, a big potential boost to the use of cellulose in making sports and activewear happened much more recently when Lenzing, a long-time leader in cellulose-based textiles, decided to combine its Tencel product with modified cross-section polyesters that carry the Coolmax guarantee of enhanced performance.

"We've been carrying out joint technical tests since the start of the year," confirms Gerard Illeras, who is responsible for marketing for the sportswear sector at Advansa, the company that has the rights to Coolmax in Europe, the Middle East and Africa. "We're in the final phase of the those tests now, and we're already producing fabric that combines the benefits of both Coolmax and Tencel, the smooth feel and the moisture absorption capabilities of Tencel with the wicking and evaporative cooling properties of Coolmax."

Tencel is highly hydrophilic and has a great capacity to absorb moisture. Each fibre consists of a large number of crystalline nano-fibrils closely packed together. When the fabric comes into contact with liquid or vapour, voids and capillaries open up in the structure, making spaces for the moisture to move into.

The overall result, Illeras explains, is a fabric that prolongs the effect of Coolmax, keeping the body cool and comfortable for the duration of a session of moderate exercise. "This combination will be ideal for garments that people will wear next to the skin for general fitness activities such as a session at the gym."

At partner company Lenzing, the head of textile development, Heinrich Firgo, says the combination of high performance polyester with a natural cellulose-based yarn such as Tencel is certain to make a big impression on the market.

"Sportswear brands will definitely find this an attractive alternative to the methods they have been using until now to allow users to stay dry. It will deliver, in an easy and permanent way, the properties they have so far only been able to build into their apparel by very complicated methods." He offers as an example the "very expensive chemical modification" that polyester products frequently undergo now. The trouble, according to the Lenzing executive, is that the resultant fabrics can often lose their high performance properties after around ten washes.

A new push

He confirms that his company began to look at launching a new push into the sports apparel market with Tencel about two years ago. It asked itself why cellulose-based products seemed to have lost ground in this sector. It could see that garments of 100% cotton, which can so quickly become completely soaked, were clearly not the answer, but Lenzing refused to accept that polyester on its own should be allowed to own the market.

"We did a basic investigation," Firgo explains, "and decided we might be able to do a better job. People like to feel dry, so the market is clearly there."

This focus on the way people feel while exercising shows that a large part of this is psychology. We may not find sweat pleasant—Firgo talks about a modern-day tendency to associate it with being poor, unhygienic and out of shape—but sweating has a very important biological function to fulfil.

You can only achieve maximum performance if you can keep your core body temperature cool, and for maximum cooling, sweat should come through your pores and evaporate from the surface of your skin.

"You can't have high performance effort without sweat," he insists.

atmosphere. For medium-range activities (golf, once again, offers a good example), cotton on the inside and Tencel on the outside works well as a combination. Puma is one company that has already included Tencel in this way in its golf clothing collections.

In a third category, though—one he calls ‘sports lifestyle’—the softness and skin-friendliness of the fibre can really come into its own. Adidas has already included it in its Stella McCartney collection, and, away from fashion, apparel for activities such as dance or yoga would also come into this area. Blends with cotton work well here, but so do garments that are 100% Tencel, Gürtler argues.

He reveals that the company is on the verge of an interesting new sports venture. A base layer garment with Tencel had already proved that the conclusions of the medical studies were valid in the field (well, on the golf course). With Tencel next to their skin, golfers noticed less rubbing and, as a result, less skin irritation than they had suffered previously.

On the back of this, Lenzing won the agreement of the Austrian Ski Federation and its technical advisers at the University of Innsbruck to have its athletes try out garments with Tencel at a training camp last summer. The skiers contributed to a detailed questionnaire on the feel of the garments during different levels of sporting activity; it was a pre-season training camp, so the skiers took part in running, climbing, mountain biking, road cycling, tennis, football and volleyball sessions.

Base layer breakthrough

All the athletes that took part in the survey said they found Tencel-based white T-shirts more comfortable to wear, before and during each work-out. They also said the shirts rubbed and stuck to the skin less than more conventional products, and they all said it performed better in managing body odour. In addition, almost all of them said Tencel was better for temperature control and moisture management. They were slightly less satisfied with similar T-shirts in black.

Overall, the results were impressive enough for the Ski Federation to commission sports clothing firm Loeffler to make a specialist base layer garment, using Tencel, for the ski-jumping and downhill teams for the start of the new winter sports season.

“When Tencel was first released, about 12 years ago,” Gürtler says, “the touch, the drape and the colour of it were what was important. But that came and went. Now, because it can outperform cotton and polyester (in moisture management, in anti-static and anti-bacterial performance) functional clothing, for sports and workwear, is becoming a very important area for us.” 

“The exception might be sprinters who, over the course of a 100-metre race, may only breathe three times. But, apart from that, if you go over your aerobic limit, you will, and should, sweat.”

Natural appeal

Lenzing realised, though, that for lighter sporting activity, and for the increasingly important sports-fashion sector, fabrics that keep the wearer cool and dry sell well. Adding in the natural qualities of cellulose-based material should make the finished product all the more attractive.

“There is definitely a trend towards natural,” Firgo insists. “I don’t want to name any names, but you can buy existing garments from really big brands, I mean really fancy stuff, pull them off your body on insulated ground and find that you have 5,000 volts on your skin. This is because the garments are made from 100% synthetic material. You can literally pull your shirt off and cause sparks to fly, and nobody knows what impact that might have on your health or well being.”

Their belief that natural fibres can play a prominent role in this sector has led these important industry players to put Coolmax and Tencel together. Advansa’s Gerard Illeras, while acknowledging that it’s often difficult for companies to work together, says that, in this case, both partners have approached the project with an open and positive frame of mind. Working together is especially daunting for companies that are reluctant to invest in new ideas, he suggests. “In our case, though, we are both dynamic companies that want to innovate and we both realised that, here, by working together, we had a real opportunity to launch a completely new concept,” he adds. “We have understood each other from the outset, and we both want the same thing: to deliver maximum benefit to consumers.” 



Adidas has employed Tencel fibre in its Stella McCartney range.

 Adidas